

## **EXECUTIVE SUMMARY**

### **Environmental Impact Assessment & Environmental Management Plan**

**For**

**PROPOSED 2 X 2 MTPA COAL WASHERY (Wet Process)**

**at**

**Village- Batari, Tehsil- Khatgora,  
District- Korba, State - Chhattisgarh  
(Area: 8.195 Ha)**

*ToR File No. F. No- J-11015/512/2014-IA.II(M) dated 18<sup>th</sup> August 2015*

**Project Proponent:**

**M/s CG Coal & Power Ltd.**

**EIA Consultant**



**QCI-NABET Accredited EIA Consultant for Coal Washery Sector,  
MoEF&CC (GOI) and NABL Recognized Laboratory  
ISO 9001:2008, ISO 14001:2004, OHSAS 18001:2007**

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**Report No. ANqr /PD/20A/2014/30**

**OCTOBER, 2016**



## EXECUTIVE SUMMARY

### 1.0 INTRODUCTION

M/s CG Coal and Power Ltd. was incorporated under the provision of Companies Act 1956 (No. 1 of 1956) on 30<sup>th</sup> September, 2002. The Govt. of Chhattisgarh has pleased to execute Memorandum of Understanding (MOU) with M/s CG Coal and Power Ltd on 04<sup>th</sup> May 2016 and agreed to provide all help and facilitate clearances necessary for setting up 2x2 MTPA coal washery in the state of Chhattisgarh. The Govt. of India, Ministry of Commerce and Industry, Secretariat for Industrial Assistance has issued Industrial Entrepreneur Memorandum (IEM), acknowledgment no. 134/SIA/2015 dated 23<sup>rd</sup> January 2015 for establishment of coal washery project at Batari Road, Dipka, Tahsil: Katghora, Dist: Korba in the State of Chhattisgarh. MoEF vide its GSR 2 (E) dated 2<sup>nd</sup> January 2014 stipulated use of coal with ash content of less than 34% in power plants located between 750-1000 kms from pit head with effect from the 1<sup>st</sup> day of January, 2015 and in power plants located between 500-749 kms from pit head with effect from the 5<sup>th</sup> day of June, 2016.

Thus, the proposed coal washery will facilitate in supply of washed coal to the industries. Also the proposed Coal Washery unit will generate revenue for the State Government by way of taxes on coal and benefit the local people by way of direct and indirect employment. This project is expected to yield a positive impact on the socio - economic environment of the region. It will also help in sustainable development of this area including further development of physical infrastructural facilities.

#### 1.1 Identification of Project

The company has proposed to setup coal washery plant of 2 x 2 MTPA capacity in 2 phases each of 2.0 MTPA on lease hold land of 20.25 acres (8.195 ha) provided by Chhattisgarh State Industrial Development Corporation Limited (CSIDCL), Raipur in village: Batari, Tahsil: Katghora, Dist: Korba, Chhattisgarh for establishment of coal washery and other allied projects. Before allocation of lease hold land to the C G Coal & Power Ltd, the official of State Government has adopted proper procedure related to the land acquisition and also obtained consent of Gram Sabha of the area for establishment of coal washery. This site is nearer to existing operational coal mines of South Eastern Coalfield Ltd (SECL) and connecting road of Korba-Bilaspur State Highway (SH-04), thus suitable for coal washery project.

The project falls under Sector 2 (a) in Category A as per the EIA Notification 2006, based on the capacity of the project. The project was presented before Expert Appraisal Committee (EAC) of Thermal & Coal Mining Projects, MOEF&CC, New Delhi in its 27th meeting held on 18th -19th December, 2014; 37th EAC meeting held on 11th -12th June, 2015 and 39th EAC meeting held on 16th – 17th July, 2015. In the meeting, honourable EAC recommended Terms of Reference (TOR) for 2x2 MTPA capacity (Wet process) in an area of 8.195 ha, vide letter no. No.J-11015/512/2014-IA-II (M) dated 18th August 2015. The capital cost of the proposed coal washery project is estimated to be Approx. Rs.60 Crore.

The Coal washery project has now been categorized as Orange Category project as per the Press note of MOEF&CC dated 05<sup>th</sup> March 2016 and as per Final Document on “Revised Classification of Industrial Sectors Under Red, Orange, Green and White Categories” issued by Central Pollution Control Board (CPCB) on dated February 29, 2016; the overall pollution Score has been found to be less than 60, hence has been moved from Red to Orange Category. **This indicates that the proposed project is not of highly polluting nature hence has been moved from Red category to orange.**

## 1.2 DRAFT EIA/EMP REPORT

Proposed coal washery project of M/s CG Coal and Power Ltd. is classified as “Category A” as per the EIA notification dated on 14<sup>th</sup> September, 2006. Baseline environmental monitoring was conducted in line with the ToR during post-monsoon season (October 2015 to December 2015) for determining the status of ambient air quality, ambient noise levels, surface and groundwater quality, soil quality, status of flora, fauna and eco-sensitive areas and socio-economic status of the villages within 15 km radius study area. The observations of the studies are incorporated in the draft EIA/EMP report. Impacts of the proposed project activities during construction and operation stages were identified and duly addressed in the draft EIA/EMP report along with the proposed management plan to control / mitigate the impacts. Environmental Management Plan is suggested to implement the pollution control measures for the project. The salient features of the proposed project site are summarised and given in **Table 1.1**.

**TABLE 1.1**

### SALIENT FEATURES OF THE PROJECT SITE

Sr. No.	Particulars	Details
1.	Location	Village- Batari, Tehsil - Khatgora, Distirct - Korba, State -Chhattisgarh
2.	Khasra No.	Sy. No. 272/2, 272/4, 273/1, 273/2,274, 275, 281/2, 281/3 & 281/4
3.	Total area & present land use	20.25 Acre (8.195Ha). <ul style="list-style-type: none"> <li>• Land allotted to CG Coal &amp; Power Ltd. by CSIDC Ltd. for industrial use.</li> <li>• Availability of Barren land.</li> <li>• At very short distance from source of raw material i.e. SECL coal mines</li> <li>• Remoteness from sensitive area like forest, water body and habitation.</li> <li>• Connected to state highway, for easy transportation of raw material and finished product.</li> <li>• Very less road transport is required for transportation of raw material from nearby coal mine.</li> </ul>
4.	Site elevation	332m MSL
5.	Sol Topo sheet No.	64J/11-F44K11
6.	Nearest representative IMD station	Champa
7.	Site topography	Flat terrain
8.	Nearest highway	Bilaspur-Ambikapur (NH111)- 10.95 KM,NNW Korba - Bilaspur (SH04)- approx 13.5 KM, E
9.	Nearest railway station	<b>Nearest Railway Station:</b> Korba Railway Station ~16.22 Km, ESE
10.	Nearest airport	<b>Nearest Airport:</b> Raipur Airport ~ 155 km, SW
11.	Nearest Rivers/Lakes/Streams	Hasdeo River: 17.5 km E Ahiran Nadi: 12.4 Km, NE Khalari reservoir: 8.8 Km, SW Pitni Nala: 8.8 Km, SSW Sundhara Nala: 8.5 Km, N Kholar Nala: 6.7 Km, ENE Lilagar Nadi: 5.35 Km, S Tuma Nala: 8.1 km NW
12.	Nearest town	<b>Nearest town:</b> Korba ~ 16.21 Km, ESE <b>Nearest City:</b> Korba ~ 16.21 Km, ESE
13.	District headquarters	Korba ~ 16.21 Km, NNW
14.	Nearest state/national boundaries	None within 10 km radius
15.	Nearest village habitation	<b>Nearest Villages-</b> Batari, Tiwarta, Chainpur, Raliya, Jhabar, Malgaon, Jhingatpur, Beltikri etc. are approx. 1.0-2.0 KM
16.	Nearest tourist place	None within 10 km radius
17.	Archaeological sites	None within 10 km radius

Sr. No.	Particulars	Details
18.	Protected areas as per wildlife protection act 1972 (tiger reserves, elephant reserve, biospheres, national parks wildlife sanctuaries, community reserves & conservation reserves)	None within 10 km radius area
19.	Reserved/protected forests	Dense mixed Jungle: 1.2 km E Dense mixed jungle: 4.0 Km, NE Open Mixed Jungle: 3.7 Km, SW Manikpur P.F.: 6.7 Km, NW Chhindpani P.F.: 9.3 km SW
20.	Seismicity	Seismically, this area is categorized under Zone-III as per IS-1893 (Part 1)-2002 (Moderate damage risk)
21.	Defence Installations	None within 10 km radius area
22.	Other industries in 15 km radius	Major industries within 15 km radius area are as follows: 1. Aryan Coal washery, Binjhari village (0.96 MTPA): 2.7 km, E 2. Aryan Coal Washery, Gevra village (5.0 MTPA): 4.3 km, E 3. Aryan Coal Washery, Dipka village(12 MTPA): 3.1 km, SE 4. Spectrum Coal Washery, Ratija village (11 MTPA): 2.7 km, S 5. Maruti Coal Washery, Ratija village(3.33 MTPA): 3.3 km, S 6. ACB Coal washery, Chakabura village: 4.8 km, NE 7. ACB TPP, Chakabura village (270 MW): 4.1 km, NE 8. SV Coal Washery, Renki village (2.5 MTPA): 7.0 km, SE 9. Dipka OC Coal Project, Dipka village: 2.5 km, SE 10. Gevra OC Coal Project, Gevra village: 4.9 km, SE 11. KJSC Coal washery, Dhatura village (1.20 MTPA) : 12 km, SE

### 1.3 PROJECT DESCRIPTION

#### 1.3.1 Process Description

Raw coal from mines shall be transported to the coal washery by Tippers/dumpers. Trucks shall either dump coal into the ground hopper or on to the nearby ground dump from where the same shall be fed in the ground hopper.

#### Process of Coal Beneficiation:

- ROM coal, from ramp, will be fed to a feed hopper fitted with 250 mm inclined grating. +250 mm coal will be removed at one side and -250 mm will be collected in a feed hopper. A reciprocating feeder is provided beneath the feed hopper.
- 0 to 250 mm size coal is forwarded to a double deck vibrating screen where 0 to -6 mm fine coal is forwarded to a bunker, + 6 to -50 mm is forwarded to a bunker for feeding to Batac Jig and +50 mm to 250 mm is forwarded to double roll crusher for crushing in -50 mm size.
- Another feed hopper with inclined grating is also provided for direct feeding to the double roll crusher.
- 0 to -50 mm crushed coal is again forwarded to another similar single deck vibrating screen for screening to 0 to -6 mm and + 6 mm to -50 mm.
- 0 to -6 mm fine coal is forwarded to bunker as explained above and +6 mm to -50 mm is forwarded to a bunker for feeding to batac jig.

- f) Washed coal is forwarded to washed coal bunker and middling coal is forwarded to a middling coal bunker. Slurry is pumped to a settling tank

### **1.3.2 Raw Coal Requirement, Source & Mode of Transport**

The capacity of proposed coal washery is 2 x 2 MTPA. Raw coal sourced from job provider by road through covered trucks from job providers. Since the washery site is located close to the SECL mines in Korba and there is no existing railway siding in the vicinity of the proposed plant site, raw coal will be transported to the plant by road in covered trucks. Heavy Media will be sourced from market by road through trucks. Overloading will be strictly prohibited to avoid coal spillage. Similarly washed coal will also be returned through trucks covered with tarpaulin. Coal rejects, heavy media, shell and sand, solid wastes etc will be transported by trucks covered with tarpaulin.

### **1.3.3 Solid waste generation & Management**

About 1.2 MTPA washery reject coal will be generated from the proposed coal washery during the coal washing process. In Phase I, the solid waste generated will be about 0.6 MTPA and Phase II is about 0.6 MTPA. The rejects can be used in CFBC power plants and hence, will be sold to the nearby CFBC power plants for power generation. There will not be any storage required for the coal rejects. No other solid waste is envisaged in the coal washing process. The rejects will be transported by road up to plant site of the user industry.

### **1.3.4 Water Requirement & Source**

Total water requirement in the proposed coal washery is estimated about 14,623 KLD. Out of this, about 13,333 KLD water will be collected as process effluent and will be treated in thickeners. The treated effluent will be reused in the coal washing process. Remaining 1290 KLD water will be lost as coal moisture, evaporation losses and process losses can be met through reservoir proposed at our site and nearby surface water sources. The Water Resource Department, Government of Chhattisgarh has pleased to propose supply of requisite water through Fulzhar anicut proposed to be constructed on Ganjha Nallah (Saliha Nallah).

### **1.3.5 Manpower Requirement**

During plant operation phase, the manpower requirement is approx. 85 persons in phase wise manner i.e. Phase I-48 persons, Phase II: 37 persons, most of which will be recruited from the nearby villages and they will be trained for the requirement. Skilled & managerial staff will be recruited from nearby towns. Apart from these, some contractual jobs will be given to the local people. Thus overall 85 people will be involved in the proposed project.

### **1.3.6 Site Infrastructure**

The coal washery is proposed in Village - Batari, Tehsil – Khatgora, District - Korba (Chhattisgarh). Preference in employment will be given to local people. Hence, there is no need for provision of township. For efficient plant operation, infrastructure facilities like office, store, rest area, drinking water facilities, urinals, latrines, canteen, first aid center, etc. will be provided within the plant premises. Internal black topped roads will be developed. An ambulance facility will be kept ready to attend medical emergency.

## 2.0 EXISTING ENVIRONMENTAL SCENARIO

### 2.1 Baseline Environmental Studies

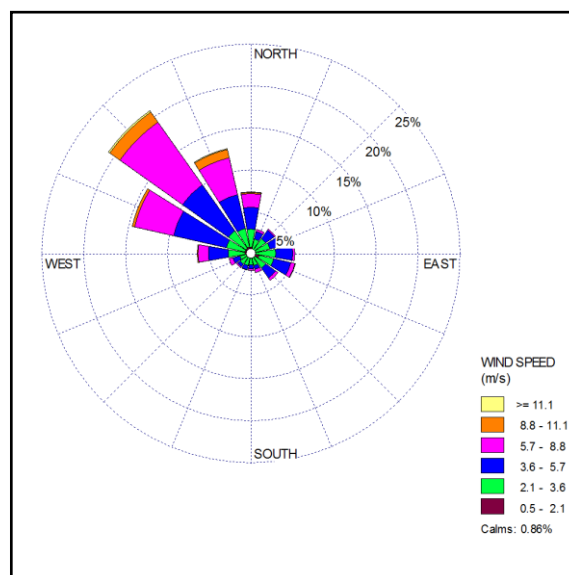
Baseline environmental studies were conducted in the proposed coal washery area and in the area within 15 km radius from the proposed coal washery area to assess the existing environmental scenario in the area. For the purpose of EIA studies, proposed coal washery area was considered as the core zone and area outside the applied coal washery area upto 15 km radius from the boundary of the proposed plant was considered as buffer zone. The baseline environmental quality data for various components of environment, viz. Air, Noise, Water, Land was monitored during post monsoon season i.e. October 2015 to December 2015 in the study area.

#### 2.1.1 Meteorology & Ambient Air Quality

##### Summary of the Meteorological Data Generated at Site (October 2015 to December 2015)

##### SUMMARY OF SITE SPECIFIC WIND PATTERN

Details	Wind Direction
First Predominant Wind Direction	NW (20.85%)
Second Predominant Wind Direction	WNW (14.5%)
Calm conditions (%)	0.86



#### Ambient Air Quality Status

The status of ambient air quality within the study area was monitored for post monsoon season i.e. October 2015 to December 2015 at 10 locations including the proposed coal washery area and in nearby villages. Total 10 sampling locations were selected based on the meteorological conditions considering upwind and downwind directions. The levels of Respirable Particulate Matter (PM<sub>10</sub>), Fine Particulates (PM<sub>2.5</sub>), Sulphur Dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) were monitored. The minimum and maximum values of monitoring results are summarized in **Table 2.1**



**TABLE 2.1**

**SUMMARY OF AMBIENT AIR QUALITY MONITORING RESULTS**

Station code	Location	PM <sub>10</sub> (µg/m <sup>3</sup> )				PM <sub>2.5</sub> (µg/m <sup>3</sup> )			
		Min	Max	Avg	98 <sup>th</sup> %	Min	Max	Avg	98 <sup>th</sup> %
AAQ1	Project site	48	62	54	61	16	21	18	21
AAQ2	Batari	45	59	51	58	17	22	19	22
AAQ3	Jhingatpur Village	53	79	69	78	20	28	23	27
AAQ4	Jhabar	53	74	65	73	18	29	24	28
AAQ5	Ranjna Village	38	59	50	58	18	26	21	26
AAQ6	Basantpur	36	55	47	55	11	22	16	21
AAQ7	Bhadrapara	36	51	44	51	14	29	20	29
AAQ8	Rainpur	44	58	50	57	14	20	16	20
AAQ9	Raliya	50	64	56	63	16	22	18	21
AAQ10	Muhariyamura	35	49	41	48	12	18	15	17
		<b>35.0-79.0</b>				<b>11.0-29.0</b>			
<b>Ambient Air Quality Standards</b>		<b>100(24 hr)</b>				<b>60 (24 hr)</b>			

**TABLE 2.1 (Contd...)**

**SUMMARY OF AMBIENT AIR QUALITY RESULTS**

Station code	Location	SO <sub>2</sub> (µg/m <sup>3</sup> )				NO <sub>x</sub> (µg/m <sup>3</sup> )			
		Min	Max	Avg	98 <sup>th</sup> %	Min	Max	Avg	98 <sup>th</sup> %
AAQ1	Project site	5.0	12.0	8.5	11.5	6.0	13.0	8.8	12.5
AAQ2	Batari	7.0	13.0	9.0	12.0	8.0	21.0	14.0	20.0
AAQ3	Jhingatpur Village	7.0	16.0	11.0	15.5	11.0	22.0	15.1	20.6
AAQ4	Jhabar	11.0	18.0	14.0	17.0	13.0	21.0	15.0	19.2
AAQ5	Ranjna Village	9.0	16.0	12.0	15.5	8.0	22.0	14.5	20.6
AAQ6	Basantpur	6.0	9.0	7.9	9.0	8.0	12.0	9.9	11.5
AAQ7	Bhadrapara	6.0	15.0	10.5	14.1	9.0	17.0	12.1	16.5
AAQ8	Rainpur	6.0	13.0	9.1	12.5	10.0	17.0	13.1	16.5
AAQ9	Raliya	5.0	9.0	7.1	8.5	9.0	13.0	11.1	12.5
AAQ10	Muhariyamura	4.0	9.0	6.7	8.5	8.0	13.0	10.7	12.5
<b>Range</b>		<b>4.0-18.0</b>				<b>6.0-22.0</b>			
<b>Ambient Air Quality CPCB Standards</b>		<b>80 (24 hr)</b>				<b>80 (24 hr)</b>			

**TABLE 2.1 (Contd...):**

**SUMMARY OF AMBIENT AIR QUALITY RESULTS**

Station code	Location	Ozone (µg/m <sup>3</sup> )				CO (mg/m <sup>3</sup> )			
		Min	Max	Avg	98 <sup>th</sup> %	Min	Max	Avg	98 <sup>th</sup> %
AAQ1	Project site	6.0	13.0	8.0	11.6	0.144	0.185	0.160	0.182
AAQ2	Batari	5.0	11.0	8.0	10.0	0.102	0.143	0.199	0.140
AAQ3	Jhingatpur Village	5.0	14.0	9.0	13.0	0.151	0.192	0.166	0.189
AAQ4	Jhabar	8.0	12.0	10.0	12.0	0.131	0.172	0.147	0.169
AAQ5	Ranjna Village	7.0	11.0	9.0	11.0	0.098	0.139	0.113	0.136
AAQ6	Basantpur	7.0	11.0	9.0	10.5	0.093	0.134	0.108	0.131
AAQ7	Bhadrapara	5.0	14.0	10.0	13.0	0.124	0.165	0.140	0.162

Station code	Location	Ozone ( $\mu\text{g}/\text{m}^3$ )				CO ( $\text{mg}/\text{m}^3$ )			
		Min	Max	Avg	98 <sup>th</sup> %	Min	Max	Avg	98 <sup>th</sup> %
AAQ8	Rainpur	9.0	13.0	11.0	13.0	0.112	0.153	0.128	0.150
AAQ9	Raliya	9.0	15.0	11.0	14.0	0.140	0.181	0.156	0.178
AAQ10	Muhariyamura	5.0.	12.0	7.0	12.0	0.174	0.215	0.190	0.212
<b>Range</b>		<b>5.0-15.0</b>				<b>0.093-0.215</b>			
<b>Ambient Air Quality CPCB Standards</b>		<b>100 (08 hrs)</b>				<b>02 (8 hrs)</b>			

**TABLE 2.1 (Contd...):**

**SUMMARY OF AMBIENT AIR QUALITY RESULTS**

Station code	Location	Benzene	BaP	Hydrocarbons
		( $\mu\text{g}/\text{m}^3$ )	( $\text{ng}/\text{m}^3$ )	( $\mu\text{g}/\text{m}^3$ )
AAQ1	Project site	ND	ND	0.019
AAQ2	Batari	ND	ND	ND
AAQ3	Jhingatpur Village	ND	ND	0.015
AAQ4	Jhabar	ND	ND	0.017
AAQ5	Ranjna Village	ND	ND	ND
AAQ6	Basantpur	ND	ND	ND
AAQ7	Bhadrapara	ND	ND	ND
AAQ8	Rainpur	ND	ND	ND
AAQ9	Raliya	ND	ND	ND
AAQ10	Muhariyamura	ND	ND	ND
<b>Range</b>		<b>ND</b>	<b>ND</b>	<b>ND-0.019</b>
<b>Ambient Air Quality CPCB Standards</b>		<b>5 (annual)</b>	<b>1 (annual)</b>	<b>--</b>

ND: Not Detectable and Source: Anacon Laboratories Pvt. Ltd., Nagpur

From the above results, it is observed that the ambient air quality with respect to PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub> and NO<sub>x</sub> at all the monitoring locations was within the permissible limits specified by CPCB.

**2.1.2 Ambient Noise Levels**

Ambient noise level monitoring was carried out at the 10 monitoring locations; those were selected for ambient air quality monitoring. The monitoring results are summarized in **Table 2.2**.

**TABLE 2.2**

**SUMMARY OF AMBIENT NOISE LEVEL MONITORING RESULTS [Leq in dB(A)]**

Sr. No.	Monitoring Locations	Equivalent Noise Level	
		Leq <sub>Day</sub>	Leq <sub>Night</sub>
<b>Residential Area CPCB Standards dB(A)</b>		<b>55</b>	<b>45</b>
1.	Raianpur	49	42
2.	Raliya	46	40
3.	Muhariyamura	50	43
<b>Range</b>		<b>46-50</b>	<b>40-43</b>
<b>Commercial Area CPCB Standards dB(A)</b>		<b>65</b>	<b>55</b>
4.	Jhabar	63	49
5.	Ranjana	56	47
6.	Bhadrapara	61	50
<b>Range</b>		<b>56-63</b>	<b>47-50</b>



Sr. No.	Monitoring Locations	Equivalent Noise Level	
<b>Silence Zone CPCB Standards dB(A)</b>		<b>50</b>	<b>40</b>
7.	Batari	46	38
8.	Basantpur	44	37
<b>Range</b>		<b>44-46</b>	<b>37-38</b>
<b>Industrial Area CPCB Standards dB(A)</b>		<b>75</b>	<b>70</b>
9.	Jhingatpur	62	57
10.	Project site	58	51
<b>Range</b>		<b>58-62</b>	<b>51-57</b>

### 2.1.3 Surface and Ground Water Resources & Quality

#### Water Resources

The area for proposed coal washery comprise of uncultivated land owned by the project proponent. The proposed plant site is a flat terrain with general elevation of 165-435m MSL. The area is scantily vegetated and there is no habitation in or adjacent to the project area. There is no perennial or seasonal surface water body nearer to the coal washery area. The surface run-off during monsoon joins nearby seasonal streams. The study area around the project site is almost flat with elevation varying from 325 m to 332 m MSL. The area as a whole represents gentle slope and general slope of the area is towards ESE, SW and WNW having 7-37 degree especially in the mining area.

Apart from some shrubs, there is no vegetation in the proposed coal washery area. There is no habitation in the proposed washery site.

The surface run-off during monsoon joins nearby seasonal streams. However, nearest water bodies within 5.0 km from the project site are Lilagar Nala ~3.18 km (SSW), Lilagar Nadi~5.35 km (S), and Ganjha Nala (Saliha Nala).

#### Water Quality

The existing status of groundwater and surface water quality was assessed by identifying 9 ground water (Bore wells) locations in different villages and 9 surface water samples from surface water sources existing within 15 km radius of the plant site.

##### A. Groundwater Quality

The physico-chemical characteristic of groundwater was compared with the IS-10500 standards. The pH of the water samples collected ranged from 7.07-8.41 and within the acceptable limit of 6.5 to 8.5. The total dissolved solids were found in the range of 121-1138 mg/l in all samples. The total hardness varied between 58-312 mg/l in all samples collected at 9 locations.

In all samples, Nitrate concentration levels observed between 1.02-33.1 mg/l, fluoride varied between 0.11-0.71 mg/l, Calcium hardness varied between 34-208 mg/l and Sulphate 1.6-292 mg/l mg/l. The heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Fe, Mn, Zn and Hg) were found to be within permissible limits except Iron content in most of the ground water samples. **Overall groundwater quality was found to be highly mineralized with respect to hardness, total dissolved solids, chloride and sulphate. Heavy metals are found to be within permissible limits except Iron.**

##### B. Surface Water Quality

The results of the surface water samples analysed and are compared with the IS-10500 standards. The analysis results indicate that the pH ranged between 7.31-8.27 which are well within the specified standard of 6.5 to 8.5. The TDS was observed to be 121-244 mg/l which is within the

permissible limit of 2000 mg/l. The total hardness recorded was in the range of 76-166 mg/l as CaCO<sub>3</sub> which is also within the permissible limit of 600 mg/l. The nitrate was found to be in the range of 1.9-8.17 mg/l. The levels of chloride and sulphate were found to be in the range of 14.36-37.33 mg/l and 11.87-18.66 mg/l respectively. Heavy metals content (i.e. As, Al, Cd, Cr, Cu, Pb, Fe, Mn, Zn and Hg) were found to be low and within specified standards except iron in some of the surface water samples. The overall surface water quality was found to be mineralized, however safe physico-chemically for drinking purpose but unsafe bacteriologically and need chlorination before use for drinking purpose.

### C. Bacteriological Characteristics

Coliform group of organisms are indicators of faecal contamination in water. Water samples were analysed for total and faecal coliform by membrane filtration technique. In groundwater samples, total coliform & faecal coliform were absent in all the samples. Whereas surface water was found to be faecally contaminated. From the results, it was observed that, groundwater is suitable for drinking and domestic uses in absence of alternate drinking water source whereas surface water was not suitable for drinking and requires chlorination/ disinfection before consumption.

#### 2.1.4 Land use Land Cover classification

The land-use & land cover map of the 15 km radial study area from the periphery of project site has been prepared using Resource SAT-2 (IRS-P6), sensor- LISS-4 having 5.6 m spatial resolution and date of pass 22 Nov 2015 satellite image with reference to Google Earth data and the IRS-P5-Cartosat-I data having 2.5 m spatial resolution and date of pass Jan 2015. In order to strengthen the baseline information on existing land use pattern, the following data covering approx. the proposed project site as well as the 10km and 15 km radius from the periphery of the project site i.e. 22°13'44.89" N - 22°29'56.53" N latitude and 82°30'35.01" E - 82°31'29.04" E longitude and elevation 299-329 meter are used.

The Land Cover classes and their coverage are summarized in **Table 2.3**.

**TABLE 2.3**

**LU/LC CLASSES AND THEIR COVERAGE WITHIN 15 KM RADIUS**

Sr. No.	LU/LC Class	Area (Sq.Km <sup>2</sup> )	Percentage (%)
1	<b>Built up Land Rural/Urban)</b>		
	Settlement	29.89	4.23
	Industry/other industries	12.45	1.76
	Road Infrastructure	3.21	0.45
	Railway Line/Railway Siding	0.75	0.11
2	<b>Agriculture Land</b>		
	Cropland/Current Fallow Land	414.56	58.68
3	<b>Water bodies</b>		
	River/Nala/Stream	15.96	2.26
	Pond/Tank	3.63	0.51
4	<b>Scrub/Waste Land</b>		
	Land with scrub/Open Scrub	88.56	12.54
5	<b>Dense Forest</b>		
	Open Mixed Jungle	19.56	2.77
	Forest Plantation	8.45	1.20

Sr. No.	LU/LC Class	Area (Sq.Km <sup>2</sup> )	Percentage (%)
6	Mining/Stone Quarry	35.9	5.08
	Total	706.5	100

### 2.1.5 Soil Quality

For studying soil profile of the region, sampling locations were selected to assess the existing soil conditions in and around the proposed project site representing various land use conditions. The physical, chemical properties and heavy metals concentrations were determined. The samples were collected by ramming a core-cutter into the soil up to a depth of 15-20 cm. Total 10 soil samples within the study area were collected and analyzed.

From the analysis results of the soil samples, it was observe that the soil was medium fertile to fertile and having low productivity. The soil in the study area needs additional fertilizers for improving the fertility status and increase in crop productivity. The concentration levels of heavy metals in the water extract of soil were found to be low with a negligible concentration level of cadmium, chromium, lead, cobalt and selenium. The organic matter and organic carbon was found in the range of 0.91-1.27 % and 0.53 – 0.73% respectively indicating moderate organic content in the soil. Overall, the soil quality in the area was found to be medium fertile to fertile.

### 2.1.6 Biological Environment

#### Flora in the core & Buffer Zone

The climatic, edaphic and biotic variations with their complex interrelationship and composition of species, which are adapted to these variations, have resulted in different vegetation cover, characteristic of each region. The following account of floral diversity, based on the field survey conducted for a short duration, is aimed only to give a general pattern of vegetation of this region as a baseline data.

Total 132 species were observed during site visit survey which belongs to 49 families. The dominant family within the area is leguminosae hold first rank. No any sensitive species were observed within the study area. The details as under:

Flora	Within study area
Tree	75
Herbs	20
Shrubs	16
Grasses	14
Climbers	7
	<b>132</b>

#### Fauna in the core & Buffer zone

The availability of fauna within the study area included spotted deer, black napped hare, Jackal and wild boar other common mammalian species were, monkey, Jungle cat, squirrel, rat, mongoose and bat etc. were a commonly inhabitant in the forest area. The forests were observed in the study area in degraded conditions due to biotic pressure in surrounding area. There was no direct or indirect sightings for schedule I animals. The common reptiles such as lizard, garden lizard, and different varieties of snakes were

reported in the locality. Birds were observed throughout the study area but mostly seen near forest area, paddy fields and water bodies. River Lilagar is a major source of fresh water fishes within study area. In order to improve the habitat of surrounding flora and fauna, biological conservation plan suggested and budgetary provision given accordingly.

### 2.1.7 Socio-economic Environment

Information on socio-demographic status and the trends of the communities within 15 km radius, was collected through primary social survey and secondary data from census 2011 & village directory 2011. Summary of the socio-economic status of the study area is given in **Table 2.4**.

**TABLE 2.4**

**SUMMARY OF SOCIO-ECONOMIC ENVIRONMENT OF VILLAGES WITHIN 10 KM RADIUS AREA**

Zone	No_ HH	TOT_ P	TOT_ M	TOT_ F	P_0 6	M_0 6	F_0 6	P_ S C	M_ S C	F_ S C	P_ S T	M_ S T	F_ S T
0-5 km	11304	50429	26157	24272	7054	3670	3384	3971	2028	1943	15776	7889	7887
5-15 km	12696	54131	27276	26855	8170	4105	4065	6601	3320	3281	23966	12017	11949
10-15 km	19291	82489	41385	41104	12380	6263	6117	7400	3782	3618	42037	20969	21068
<b>0-15 km</b>	<b>43,291</b>	<b>1,87,049</b>	<b>94,818</b>	<b>92,231</b>	<b>27,604</b>	<b>14,038</b>	<b>13,566</b>	<b>17,972</b>	<b>9,130</b>	<b>8,842</b>	<b>81,779</b>	<b>40,875</b>	<b>40,904</b>

Source: Primary census abstract 2011, district Korba, state Chhattisgarh

**Note:** No\_ HH: Number of household, TOT\_P: Total population, TOT\_M: Total Male, TOT\_F: Total female, P\_06: Population 0-6, M\_06: Male 0-6, F\_06: Female 0-6, P\_SC: Population SC, M\_SC: Male SC, F\_SC: Female SC, P\_ST: Population ST, M\_ST: Male ST F\_ST: Female ST

#### 2.1.7.1 Socio economic survey

##### Primary Socio-Economic Survey Methodology

The study was carried out with a participatory approach by involving the stakeholders, particularly the project beneficiaries and probable affected persons through a series of consultative process. The population groups that were consulted include beneficiary group of people in the project influence area, particularly the shopkeepers, farmers, school teachers, gram panchayat Sarpanch/members and village elders etc. This approach was helped to know the exact situation and views of the people about the project.

Proportionate and purposive sampling methods were used for selecting respondents (male and female) for household survey. Out of 130 villages, 20% villages were surveyed (25 villages). For official information of villages, sarpanch/gram panchayat members were elected. Structured questionnaires were used for survey. For group discussion, panchayat bhavan, Aanganwadi bhavan, community halls were used.

### 3.0 ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

#### 3.1 Identified Impacts during construction phase and proposed mitigation measures

##### Ambient Air Quality

During construction phase, dust will be the main pollutant, which will be generated from the site development activities and vehicular movement on the road. Further, concentration level of SO<sub>2</sub>, NO<sub>x</sub>

and CO may also slightly increase due to increase in vehicular traffic. Sprinkling of water at regular intervals preferably using truck-mounted sprinklers along the roads and work zone areas will be carried out to control fugitive dust emissions.

### **Water resources and Quality**

There will not be any process wastewater generation during the construction phase. The surface run-off during rainy season from the broken up areas containing silt wash off may be carried to the seasonal streams flowing outside the project area. Wastewater generation during the construction period will be from domestic effluent from the sanitation facilities provided for the workers. The earth work (cuttings and fillings) will be avoided during rainy season. In-plant roads will be concreted. Soil binding and fast growing vegetation will be grown within the plant premises to arrest the soil erosion. Septic tanks and soak pits will be constructed for disposal of domestic effluent.

### **Ambient Noise Levels**

The major sources of noise during the construction phase are vehicular traffic, construction equipment like dozers, scrapers, concrete mixers, cranes, pumps, compressors, pneumatic tools, saws, vibrators etc. Equipment will be maintained appropriately to keep the noise level within 85 dB(A). Wherever possible, equipment will be provided with silencers and mufflers. Acoustic enclosures will be provided to stationary machines like DG sets, wherever possible. High noise generating construction activities will be restricted to day time only. Greenbelt will be developed from construction stage.

### **Ecology & Land environment**

20.25 acres of land is uncultivated land with sparse vegetation and given by the Chhattisgarh State Industrial Development Corporation Limited (CSIDC) on 99 years lease for establishment of coal washery and other allied projects. There will not be any change in the land use pattern outside the plant premises. Plant design will be maintained such that there will not be any need of cutting the existing trees. Plantation of green belt along the plant boundary will be taken up during plant construction stage.

## **3.2 Identified Impacts during Operation phase and proposed mitigation measures**

### **3.2.1 Ambient Air Quality**

#### **Impacts on Air Quality**

Sources of emissions from the coal washery project include unloading of raw coal by trucks to ground hopper, coal crushing and screening, stacking of raw coal, washed coal and rejects, transportation of raw coal, washed coal and rejects by trucks, use of DG sets etc. Ambient air quality modeling was carried out to assess the impacts on air quality due to proposed 2 x 2 MTPA coal washery. ISCST3 Dispersion Model was used for assessing air pollution load from washery operations and coal transportation through road.

The maximum incremental rise of ground level concentration (GLC) due to unloading/loading and transportation of raw coal and heavy media for particulate matter generated from the different activities in the areas is carried out. The predicted 24 hourly maximum concentrations for mining activity like loading/unloading, transportation, was found to be 13  $\mu\text{g}/\text{m}^3$  in the SE & ESE directions. The maximum incremental ground level concentrations (GLCs) for particulate matter,  $\text{SO}_2$  and  $\text{NO}_x$  due to proposed developmental activities were carried out. The predicted 24 hourly maximum concentrations for, particulate matter,  $\text{SO}_2$  and  $\text{NO}_x$  are found to be 1.2  $\mu\text{g}/\text{m}^3$ , 0.00046  $\mu\text{g}/\text{m}^3$  and 0.31  $\mu\text{g}/\text{m}^3$  at a distance of 1.4 km, 1.4 km & 1.4 km respectively in SE direction and the cumulative

concentration levels (Ambient + proposed incremental) revealed that the concentration levels for particulate matter, SO<sub>2</sub> and NO<sub>x</sub> likely to be encountered in the operation of the project are respectively at distance of 1.4 km, 1.4 km & 1.4 km distance in SE direction with a concentration levels (cumulative) of 80.2 µg/m<sup>3</sup>, 18.00046 µg/m<sup>3</sup> and 22.31 µg/m<sup>3</sup> respectively.

The overall cumulative concentration (Maximum baseline ambient + proposed incremental) of particulate matter (PM<sub>10</sub>) considering DG set, crusher unit and transportation was found to be 93.2 µg/m<sup>3</sup> which is well within the NAAQS levels prescribed by CPCB.

### **Air Pollution Control Measures**

- Plantation of tall trees along transport road and boundary of the project site;
- Widening of existing public road proposed for coal transport, where necessary.
- Periodic maintenance of public road used for coal transport in collaboration with PWD.
- Periodic water sprinkling on roads used for coal transport.
- Provision of water sprinklers at railway siding area during unloading / loading of coal
- Fixed water sprinklers will be provided at all plant areas where materials are loaded / unloaded.
- Provision of bag filters of adequate capacity for coal crushers.
- Use of covered conveyors for internal transport of coal.
- Provision of dust extraction / water sprinkling arrangement at all transfer points.
- Dust mask will be provided to all the workers.
- Transportation of graded coal / rejects will be carried out during day time only;
- The speed of trucks transporting coal will be controlled to avoid generation of dust;
- Coal will be transported only through trucks covered with tarpaulin. Overloading will be strictly prohibited.

### **3.2.2 Impact on Traffic Density**

M/s C.G. Coal & Power has intends to establish a coal washery (wet process) of 2 X 2 MTPA in two phases each of 2.0 MTPA capacity in Batari village of Khatgora Tehsil of Korba district. The coal will be sourced from different mines of SECL i.e. Deepka, Gevra, Kusmunda and other mines of SECL located in Korba and Raigarh area.

Raw coal will be transported from SECL coal mines upto the Gevra railway siding by railway wagons/ by road. From there, the coal will be transported upto the raw coal hopper located at about 1.5 km SSW by covered trucks. Thus, there will be minimum road transportation required for transportation of raw coal to the coal washery. The existing road will be strengthened and widened at necessary locations to cater the increase in traffic load. The overall scenario pertaining to utilization of trucks for transportation of raw coal, washed coal and coal rejects considering the traffic load on road due to proposed coal washery is presented in **Chapter 4**.

### **Proposed Traffic control measures**

- Transportation of coal only through trucks covered with tarpaulin
- Overloading and over-speeding will be strictly prohibited
- Conducting coal transport during day time only.



- Periodic maintenance of public roads used for coal transport in collaboration with PWD
- Periodic water sprinkling on roads used for coal transport
- Plantation along both the sides of public road used for coal transport
- Provision of speed breakers, traffic signals, etc. at strategic locations
- Conducting awareness programs for traffic safety

### 3.2.3 Ambient Noise Levels

From the modeling results, it can be seen that the ambient noise levels (day time and night time) at all the locations will remain within permissible limits even in worst case scenario except at N1 (Resultant noise levels during day time 71.8 dBA and 81.7 dBA night time) where remarkable change in noise levels is observed in both day and night time noise levels; however, only night time noise levels are expected to cross the noise limit for industrial land use. It can be further concluded that in actual conditions due to presence of various topographical features in the path of sound propagation, and greenbelt development in and around the plant site the noise levels will be attenuated.

### Proposed Noise Control Measures

- Labor camp should be located away from the construction site.
- Construction camps should be located at least 500 m distances from nearest habitation, silence zone, forests etc.
- If near habitation, silence zone, forests, construction activities should be halted in night time.
- Equipment should be standard and equipped with silencer. The construction equipment should be good working conditions, properly lubricated and maintained to keep noise within permissible limits. Noise limits for construction equipments used in this project (measured at one meter from the edge of the equipment in free field) such as compactors, rollers, front loaders, concrete mixers cranes (movable), vibrators and saws shall not exceed 75 dB (A), as specified in the Environment (Protection) Rules, 1986
- High noise zone should be marked and earplugs shall be provided to the workmen near high noise producing equipment. The workmen should be made aware of noise and vibration impacts on their health and mandatory use earplugs.
- Proper shifting arrangement of workers shall be made to prevent over exposure to noise and vibration.
- Tall trees with heavy foliage shall be planted along the boundary of construction camps, project site which will act as a natural barrier to attenuate noise levels.
- Silent DG sets shall be used at construction camps / construction sites.
- Speed limits shall be enforced on vehicle.
- Use of horns / sirens shall be prohibited.
- Regular noise monitoring shall be carried at construction camps / construction sites to check compliance with prevailing rules.

### 3.2.4 Water Resources & Quality

#### Impact on Water Resources & Quality

There is no surface water stream flowing within the project site. No ground water withdrawal is proposed for the project. Hence, no impact is envisaged on the ground water. About 1290 m<sup>3</sup>/day make up water will be required for industrial, dust suppression and domestic use during the operation

phase of the proposed coal washery project. The water is proposed to be sourced from Fulzhar Anicat to be constructed on Ganjha Nala (Saliha Nala) and reservoir proposed at project site.

The potential sources of wastewater / effluent generation in the proposed coal washery project are storm water run-off carrying coal particles & silt, coal washery effluent and domestic effluent from plant premises. These effluents / wastewaters, if discharged to environment (surface streams / land), will not only increase the plant water requirement, but will also cause significant pollution of the receiving water bodies / land surfaces.

### Proposed Water Conservation & Water Pollution Control Measures

- M/s CG Coal and Power Ltd. will implement water recovery system involving high speed thickener coupled with belt press for maximum recovery of water and recirculation of the recovered water in process, thereby making the plant a zero discharge unit. This will drastically reduce the fresh water requirement in the plant and will also protect the surface water quality of resources flowing outside the plant area.
- Apart from this, M/s CG Coal and Power Ltd. will also implement rainwater harvesting measures in the plant premises. This will involve collection of the storm water run-off from the plant premises to a settling tank and use of the settled water in coal washing process, dust suppression and plantation in the plant premises.
- Domestic discharge from rest shelters, canteens and toilets will be channeled through proper sewage drains connected to septic tanks followed by soak pits.
- Storm water run-off from the plant area and parking premises will be collected in a series of settling tanks and will be utilized for coal washing, dust suppression and plantation.
- Wash water from workshop will be treated in oil & grease trap and treated water will be used for sprinkling at coal stack yard.

### 3.2.5 Land Use Pattern

The proposed coal washery project will be located in 20.25 acres area. The land is already acquired by M/s CG Coal and Power Ltd. and comprise of uncultivated land with few shrubs. The proposed land utilization pattern for the coal washery project is given in **Table 3.1**.

**TABLE 3.1**

#### PROPOSED LAND USE OF COAL WASHERY AREA

Sr. No.	Particulars	Area (Acre)	%
1	Washery plant	7.5	37.0
2	Coal Storage yard	2.5	12.3
3	Reject storage yard	1.0	4.9
4	Greenbelt & Plantation area	7.0	34.6
5	Water reservoir & Rainwater harvesting area	1.0	4.9
6	Office building and rest shelters	1.25	6.2
	<b>Total</b>	<b>20.25</b>	<b>100.0</b>

### Measures to avoid impact on land use pattern

- Development of thick green belt in 7.0 acres area within plant premises;
- Aesthetic land scaping of plant and maintaining natural gradient;
- Stacking of raw coal, washed coal and coal rejects will be carried out at designated areas within the plant premises.

- Regular maintenance of internal roads and public roads used for coal transport.
- Plantation along the village roads used for coal transport.
- Adoption of suitable air pollution control measures to control dust emission.
- Adoption of 'Zero Effluent Discharge' Practice.

### 3.2.6 Solid Waste Generation & Management

- About 1.2 Million Tonnes per annum washery rejects will be generated, which will be supplied to CFBC based thermal power plants.
- Sludge from thickener will be mixed with coal rejects and will be supplied to user industries.
- Spent oil & grease will be separately collected and stored in leak proof containers and will be sold to the CPCB/SPCB authorised recycling vendors.
- Damaged / worn out parts of the machines will be collected and stored in shed on concrete flooring. These parts will be returned to the manufacturing company or will be sold to the authorized recycling vendors.
- The food waste from canteen will be dumped in a composting pit provided in plantation area and the compost will be used as manure for plantation in green belt area.

### 3.2.7 Biological Environment

The 20.25 acres land selected for proposed coal washery is owned by the company, is a barren land with few shrubs. In consideration of land cover of study area within 15 km radius, predominantly covered by natural habitats like Agriculture land (58.68%) followed by Forest land (14.38%). There are no any rare, vulnerable or endangered species observed either in the vicinity of project site or 15 km radial distance from the study site.

However, based on past experience, dust deposition on leaf lamina may takes place on nearby local plant species during washery operation along the transport road. Agricultural crops can be injured when exposed to high concentrations of various air pollutants especially particulate matter (dust) & SO<sub>2</sub>. Injury ranges from visible markings on the foliage, to reduced growth and yield, to premature death of the plant.

### Proposed Biological Environment Conservation Measures

- Development of thick green belt in 7.0 acres area within the plant premises.
- Preference for high canopy plants with local varieties
- Perennial and evergreen plants will be preferred.

### Control Measures to avoid impacts on agriculture crops:

1. Periodic maintenance of coal transport road in collaboration with PWD
2. Regular sprinkling of water through mobile tankers on coal transport road upto the railway siding.
3. Adoption of covered transport system
4. Thick green belt plantation along the transportation route

### 3.2.8 Socio-economic Environment

- Land for the proposed coal washery is already owned by M/s CG Coal and Power Ltd. There is no rehabilitation and resettlement involved in the project.

- The proposed coal washery will require about 85 workers with various skills in phase wise manner i.e. Phase I-48 persons, Phase II: 37 persons as direct employees. This will provide employment opportunities to the local people as most of the workers will be recruited from nearby villages.
- Due to coal washery activities, vehicular movements will be increased in nearby villages.
- The establishment of coal washery will also result in improvement in the existing infrastructure facilities like roads, electricity, communication facilities, etc.
- Under the Corporate Social Responsibility of the company, M/s CG Coal and Power Ltd. will take up various socio-economic development programmes in the nearby villages, which will improve socio-economic status of the nearby villages.

#### **4.0 ENVIRONMENTAL MONITORING PROGRAM**

An Environmental Management Cell (EMC) will be established for the proposed coal washery project under the control of Unit Head (Coal washery). The EMC will be headed by an Environmental Manager having adequate qualification and experience in the field of environmental management. Environmental monitoring of ambient air quality, surface and ground water quality, ambient noise levels, etc. will be carried out through MOEF accredited agencies regularly and reports will be submitted to SPCB/MoEFCC.

#### **5.0 RISK ASSESSMENT & DISASTER MANAGEMENT PLAN**

The assessment of risk in the proposed coal washery project has been estimated for fire, explosion and toxicity and corresponding mitigation measures are suggested in the Draft EIA/EMP report.

A detailed Disaster Management Plan for facing disasters due to natural effects and human reasons is prepared and incorporated in the draft EIA/EMP report for ensuring safety of life, protection of environment, protection of installation, restoration of production and salvage operations in this same order of priorities. For effective implementation of Disaster Management Plan, it will be widely circulated and personnel training through rehearsals. Site facilities, procedures, duties and responsibilities, communications, etc. are considered in detail in the Disaster Management Plan.

#### **6.0 PROJECT BENEFITS**

The proposed project of coal washery at Batari village would provide development of area and consequent indirect and direct job opportunities which would finally result in improvement in the quality of life of people in the central region and especially in the area around the coal washery site. In line with this, CSR policy, M/s CG Coal and Power Ltd. will carry community welfare activities in the following areas:

- Community development
- Education
- Health & medical care
- Drainage and sanitation
- Roads
- Drinking water supply occasionally through tankers

A budget of Rs. 35.5 Lakh as Capital cost and Rs. 26.6 Lakh per annum as recurring expenses has been proposed for implementation of Socio-economic welfare activities in the nearby villages.

## 7.0 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan comprise of following set of mitigation, management, monitoring and institutional measures to be taken during implementation and operation of the project, to mitigate adverse environmental impacts or reduce them to acceptable levels.

- Overall conservation of environment.
- Minimization of natural resources and water.
- Safety, welfare and good health of the work force and populace.
- Ensure effective operation of all control measures.
- Vigilance against probable disasters and accidents.
- Monitoring of cumulative and longtime impacts.
- Ensure effective operation of all control measures.
- Control of waste generation and pollution.

The capital cost of the proposed project is approx. Rs 6000 Lakhs. It is proposed to invest an amount of Rs. 412.70 Lakh as capital cost and Rs. 101.15 Lakh/annum as recurring expenses towards implementation of Environmental Management Plan.

## 8.0 CONCLUSION

The proposed 2 x 2 MTPA coal washery project of M/s CG Coal and Power Ltd. will be beneficial for the overall development of the nearby villages. Some environmental aspects like dust emission, noise, wastewater generation, traffic density, etc. will be controlled within the permissible norms to avoid impacts on the surrounding environment. Necessary pollution control equipment like bag house, water sprinklers, enclosures, thickener, etc., will form integral part of the plant infrastructure. Additional pollution control measures and environmental conservation measures will be adopted to control/minimize impacts on the environment and socio-economic environment of the area. Measures like development of thick green belt and plantation within plant premises and along transport road, adoption of rainwater harvesting in the plant and in nearby villages, etc. will be implemented. The CSR measures proposed to be adopted by the company will improve the social, economic and infrastructure availability status of the nearby villages.

The overall impacts of the proposed coal washery will be positive and will result in overall socio-economic growth of nearby villages.